

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) IMPROVEMENTS IN OR RELATING TO DISPENSING
 CLOSURE ASSEMBLIES FOR BOTTLES OR OTHER
 CONTAINERS

(71) We, ATLANTIC DESIGN & DEVELOPMENT CORPORATION, of 10 River Street, Stamford, Connecticut 06902, United States of America, a corporation organised and existing under the laws of the State of Connecticut, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to dispensing bottles or other containers and, more particularly, to dispensing closure assemblies for containers.

Hitherto, dispensing closure or caps of containers have required the use of two hands, one hand holding the container and the other hand for manually opening the cap either by unscrewing or otherwise. It is an object of the present invention to provide a dispensing closure assembly for a container which may be readily opened or closed by the touch of a finger, even whilst holding the container in one hand and which, moreover, does not require the user's fingers to touch the dispensing area, i.e. the regions of the closure assembly with which the contents being disposed from the container comes into contact, thereby reducing the possibility of contamination of the contents through dirty fingers, or of contamination of the user's fingers by contact with the contents.

The invention consists in a dispensing closure assembly for a bottle or other container, comprising at least one opening for communicating with the interior of the container, a closure member pivotally supported over said opening or openings, said closure member being manually pivotable by application of finger pressure to the rear side thereof into an open position, and by finger pressure to a forward portion thereof into a closed position, the forward portion being removed from these regions of the closure assembly with which, in operation of the assembly, the contents of the container

comes into contact, and means limiting the extent of pivotal movement of said closure member.

The invention also consists in a bottle or other container having a dispensing closure assembly as just defined.

A problem also rises in dispensing, for example, very fine particulate materials such as finely divided powders. These materials tend to sift out of the dispensing closure of the dispenser in which they are marketed when the dispensers are moved or roughly handled, as during transportation, and this results in an unacceptable loss of the particulate material. Furthermore, the sifting material tends to coat the surfaces of the dispensing containers making them commercially unattractive.

According to a feature of this invention, the pivoted closure member of the dispensing closure assembly may be constructed so that, when closed, it securely seals the dispenser opening against the sifting or leakage of particulate materials or liquids.

The invention also consists in a dispensing container comprising a hollow container body, means on said container body forming at least one opening communicating with the interior thereof, a closure member pivotally supported over said opening or openings, said closure member being manually pivotable by application of finger pressure to the rear side thereof away from said said opening to a position wherein said opening is exposed, and by finger pressure to a forward portion thereof toward said opening to a position wherein said opening is covered, the forward portion being removed from those regions of the closure member with which material from the container comes into contact during a dispensing operation, and first sealing means on said closure member engaging with second sealing means adjacent said opening when said closure member is closed to seal said opening against the leakage of material therethrough.

In order that the present invention may be more readily understood, reference will now

be made to the accompanying drawings in which:—

Figure 1 is a front perspective view of one embodiment of dispensing bottle cap, shown open and ready for dispensing;

Fig. 2 is a perspective view of the two molded plastic parts which comprise the bottle cap of Figure 1, prior to assembly;

Figure 3 is a bottom view of the pivotal closure member shown in Figures 1 and 2;

Figure 4 is a cross-sectional view of the assembled bottle cap, taken along the line 4—4 of Figure 1;

Figure 5 is a cross-sectional view taken along the line 5—5 of Figure 4 and showing the closure member in open position by broken lines and in closed position in solid lines;

Figure 6 is a cross-sectional view similar to Figure 5 showing an alternative embodiment provided with vent means for continuous pouring;

Fig. 7 is a perspective view of the pivotal closure member of Figure 6, more clearly showing the vent and spout means; and

Fig. 8 is a cross-sectional view of the assembled and closed pourer cap taken along the line 8—8 of Fig. 6.

Fig. 9 is an exploded, front perspective view of a further embodiment of dispensing container;

Fig. 10 is an enlarged side sectional view of the assembled dispensing container (broken horizontally to permit greater enlargement) taken along line 2—2 of Figure 9 and showing the closure member in open (dotted lines) and closed (solid lines) positions;

Fig. 11 is an enlarged partial front elevational view showing the closure member in an open position;

Fig. 12 is a partial sectional view taken along line 4—4 of Figure 10 showing the pivotal supports for the movable closure member.

Referring now in greater detail to Figures 1 to 5 of the drawings, the droplet dispenser embodiment of the invention will be described. A molded plastics cap, indicated generally at 10 in Figure 1 and Figure 2, has a recess or cavity 14 formed in its top portion 15 to receive a pivotal closure member indicated generally at 11. A pair of upright transverse walls 16 and 17 are formed on the vertical walls 18 and 19 within cavity 14 to engage and support pivotal skirt portions 20 and 21 of the closure member 11. Each of the transverse walls 16 and 17 has formed in the top portion thereof a slot 22 (Figure 2) through which the skirt portions 20 and 21 are forced into seating engagement with bearing sockets 24

as shown in Figure 2. During assembly of the closure member 11 into the recess 14 of the cap 10 the molded plastics material, of which the transverse walls 16 and 17 and the shafts 20 and 21 are formed, deforms elastically

as the pivotal shafts forced into and through the slots 22—22. When the pivotal shafts 20 and 21 are seated within their respective bearing sockets 24, the elastically deformed plastics material substantially returns to its normal state whereby the shafts 20 and 21 are securely held within sockets 24 by a slight downward pressure from the shoulder corners 25 and 26 at the narrow bottom end of the slots 22—22. This downward pressure forces an arcuately curved portion 27 of closure member 11 into intimate sealing engagement with a correspondingly curved surface 28 within the recess 14 of cap 10.

A spout portion 29 of closure member 11 has a substantially cylindrical hole 30 formed therethrough with an exit port 31 at its front end and an entrance port 32 through the arcuate bearing surface 37. A corresponding opening 34 in the cap 10 (FIGURE 4 and FIGURE 5) is aligned with the entrance port 32 of closure member 11 when in the open positions as shown in FIGURE 1, and as shown by the broken lines in FIGURE 5. When the pivotal closure member 11 is in its closed position, as shown by solid lines in FIGURE 4 and FIGURE 5, the opening 34 is closed and sealed by the arcuate surface 27. To assure a leak-proof seal between the opening 34 and the surface 27, a raised annular bead 35 is provided around the top portion of opening 34 as shown in FIGURE 4 and FIGURE 5. The elastic force exerted downwardly by shoulders 25 and 26 of transverse walls 16 and 17 upon the pivotal shafts 20 and 21 forces surface 27 into liquid-tight sealing engagement with raised bead 35.

Still referring to FIGURE 4 and FIGURE 5, the bottle cap 10 is secured to the top of a bottle 36 by means of screw threads 37, which engage corresponding screw threads 38 around the neck of bottle 36. To assure a positive leak-proof seal between cap 10 and bottle 36 an annular bead 39 is formed about the lower end of the opening 34. When the cap 10 is screwed down until the shoulder 40 rests upon the upper tip of bottle 36 the annular bead 39 is elastically deformed into intimate contact throughout its periphery with surface 41 of the bottle top, thereby providing an effective stopper to prevent leakage between bottle and cap.

Referring now in particular to FIGURE 2 and FIGURE 5, an arcuate depending skirt portion 44 at the rear of closure member 11 corresponds to and engages an arcuate upstanding wall portion 45 of cap 10 when the device of the invention is in closed position as shown by solid lines in FIGURE 5. The abutting engagement between skirt 44 and wall 45 effectively locks the closure member 11 in closed position to prevent any accidental leakage or spillage during handling and shipping. However, when one of the skirt por-

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peries of the molded plastics material, the skirt 44 must be disengaged from its abutment with wall 45 by the application of finger pressure to the rear top portion of closure member 11. When this is done the closure member 11 pivots about the axis of shaft 20—21, the skirt 44 moves down as shown in FIGURE 5 into the recess 14 within the top of cap 10, the spout hole 30 moves into alignment with opening 34 and the exit port 31 moves up into open position as shown in FIGURE 1, and as shown by the broken lines in FIGURE 5. To close the closure member 11 it is only necessary to apply finger pressure to the top portion thereof at a point forward of the pivotal axis 20—21. It will be apparent that the point of application of finger pressure is removed from the regions with which the contents of the bottle comes into contact during dispensing, and in particular the region of the exit port 31.

The closing and opening actions occur with a snap of the skirt 44 and wall 45 deflect into engagement or disengagement.

The embodiment of the invention described above with reference to FIGURE 1 to FIGURE 5 of the drawings is particularly adapted for dispensing droplets of liquid, such as "dashes" of bitters or other condiments.

An alternative embodiment of the invention will now be described with reference to FIGURE 6, FIGURE 7 and FIGURE 8 of the drawings. In this embodiment, which is particularly adapted for continuous pouring of liquids, an air vent is provided in the pivotal closure member and an air venting tube is extended from a second orifice of the cap member downwardly into the neck of the bottle. The pivotal supporting means, the pressure sealing means, and the snap locking closure means are essentially the same as described hereinabove with reference to FIGURES 1 to 5 of the drawings.

Referring now to FIGURE 7 which is a perspective view from the underside of the pivotal pourer closure, a circular plan: top portion 60 has a depending skirt portion 61 which is formed in an aesthetically pleasing symmetrical curve for rear edge locking engagement with a correspondingly curved portion of an upstanding edge wall 62 of the bottle cap member indicated generally at 63 in FIGURE 6 and FIGURE 8, when the pivotal closure member of FIGURE 7 is assembled with the cap member 63 as shown by solid lines in FIGURE 6 and FIGURE 8. It is to be understood that the integrally molded pivotal shaft members 20 and 21 correspond in all respects to the similarly referenced shaft members of FIGURES 2 to 5 and are inserted in bearing sockets 64 and 65 (FIGURE 8) through slots (66 in FIGURE 6) in parallel upright trunnions 67 and 68 (FIGURE 8), in exactly the same manner as described above with reference to the first

embodiment of the invention. The convex arcuately curved bearing surface 69 of the pivotal closure member (FIGURE 7) is maintained in liquid-tight sealing engagement with the correspondingly curved concave surface 70 of the cap member 63 (FIGURE 6) by the same means heretofore described with reference to FIGURES 1 through FIGURE 5. An entrance port 71 connected with an exit port 72 by a cored passage 73 in the molded plastics closure member of FIGURE 7 correspond functionally to the passage 30 and ports 31 and 32 described with reference to FIGURE 3 above. A tubular vent passage 74 having an air entrance port 75 and an air exit port 76 is formed within the molded plastics closure member of FIGURE 7 to permit air to enter the bottle enclosure freely during pouring, and to displace the volume of liquid poured therefrom. When the closure member of FIGURE 7 is in its closed position as shown by solid lines in FIGURE 6 and FIGURE 8 both ports 71 and 76 are disengaged from their mating openings, 77 and 78 respectively, in the cap member 63, and are closed by the concave surface 70 whereby neither spillage nor evaporation can occur through passages 73 or 74. A vent tube 79 is connected with and surrounds vent opening 78 in body member 63 to prevent liquid from entering the air vent passage 74 during pouring. This vent tube 79 extends downwardly at least as far as the lower end of the cap member 63, and, in the embodiment shown in FIGURES 6 and 8, below this lower end.

An annular inner skirt portion 80 of body cap 63 fits snugly within and against the annular inner wall 82 of a bottle neck 84 as shown in FIGURE 6 and FIGURE 8, while an annular outer lip 81 snugly engages the outer wall 83 of the bottle neck 84. In this illustrated embodiment the cap body 63 is secured to the bottle neck 84 by an inwardly protruding annular ring portion 85 of the cap body which is rolled into locking engagement with an outwardly extending annular ring 86 formed on the neck of the bottle 84. It is to be understood, however, that an internally threaded cap body may be employed with the pouring dispenser, as disclosed in the embodiment of FIGURE 4 and FIGURE 5, or conversely the droplet dispensing cap of FIGURES 1 through FIGURE 5 may be secured to the bottle top by the rolled annular means shown in FIGURE 6 and FIGURE 8, if desired. The screw cap design of the first embodiment offers the advantage that if more than just a few dashes of condiment are called for, as for example when a recipe calls for a spoonful or more, the entire closure cap may be unscrewed and the required quantity may be poured directly from the bottle into an appropriate measuring container. On the other hand, the rolled edge means of securing the

cap to the bottle in FIGURE 6 and FIGURE 8 provides the advantage that the dispensing cap cannot be removed from the bottle top without destroying the cap sealing means, thereby rendering it exceedingly difficult, if not impossible, to refill an empty bottle.

Figures 9 to 12 illustrate a further embodiment comprising a dispensing container for particulate matter. The container body 110 is a hollow, generally rectangular box formed of a readily molded flexible plastics material such as polypropylene. The sides 132 and 134 of the container body may be made concave in shape as shown to facilitate the handling of the dispenser in use.

Top surface 116 of the container is recessed below the side shoulders 136 and 138 to provide room for a closure member constituted by a pivoting cover 122, and an elongated opening 118 communicating with the interior of container body 110 is provided on top surface 116 adjacent the top front corner 120 thereof. Opening 118 is surrounded by an upstanding rim 140 which forms a seal in conjunction with cover 122 in a manner more fully described below. A pair of supports 124a, 124b for the pivotal mounting cover 122 project from top surface 116 and each includes a slot 142a, 142b, for insertion of the cover pivots. An elongated recess 128 runs along the length of top surface 116 adjacent the rear of container body 110. The back of recess 128 is defined by an upstanding boss 144 which has a beveled surface 146 sloping into recess 128 as shown in Figure 10.

Cover 122 is preferably molded as a unitary member from the same material from which container body 110 is formed. As shown in Figures 10 and 12, cover 122 is a generally U-shaped member having a pair of U-shaped pivot arms 148a, 148b depending from the inner surface 150 thereof. Pivot arms 148a and 148b are respectively rotatably securing in the slots 142a and 142b to pivotally support cover 122 over opening 118. Cover 122 may thus pivot between the open (dotted lines) and closed positions shown in Figure 10.

The front end of cover 122 comprises dependent skirt portions 152 and 153 which define between them a groove 154 shaped to conform to and frictionally mate with the upstanding rim 140 surrounding opening 118. Groove 154 and skirt portions 152 and 153 thus form with rim 140 a seal when cover 122 is closed as shown by solid lines in Figure 10.

A plurality of spaced, tooth-like projections 136 extend from behind the front end of the skirt 153 and into opening 118 between a plurality of spacers 156 projecting inwardly from the inner surface 158 of container body 110 (Figures 10 and 11). Spacers 156 are

preferably spaced apart a distance which permits the teeth 130 to frictionally slide between the spacers 156 thus completing the seal when cover 122 is closed. Also, preferably, the bottom front edges 160 of teeth 130 are beveled (Figure 9) to facilitate their movement in and out of opening 118.

The back end of cover 122 comprises a resilient flap 126 having a depending portion 162 as shown in Figure 10. When cover 122 is closed (solid lines) the bottom end 162a of portion 162 abuts or very nearly abuts the top edge portion 144a of boss 144 to prevent cover 122 from accidentally opening during shipment or storage. Also, the pivoting movement of cover 122 upon opening is limited in extent by the interaction of the depending portion 162 with the bottom of recess 128 on the container body top so that teeth 130 are not completely withdrawn from opening 118 when cover 122 is opened. There is thus provided the sieve-like passage shown in Figure 11 through which particulate material contained within the dispenser may be readily and evenly distributed on a flat surface. More specifically, the pressure of the user's thumb applied to flap 126 causes the portion 162 to flex inwardly and clear top edge 144a of boss 144. Then, upon a slight pivoting movement of cover 122, the portion 162 contacts the beveled surface 146 of boss 144 which guides portion 162 downwardly into contact with the bottom of recess 128 (dotted lines Figure 10); to limit the pivotal movement of cover 122. It will be understood that the depth of recess 128 should be correlated with the length of teeth 130 so that the teeth are not fully withdrawn from opening 118 when cover 122 is pivoted to an open position.

To close cover 122, finger pressure is applied above skirt portions 152 and 153, anywhere in the vicinity of forward area 127 in Figure 10; this causes cover 122 to pivot downwardly and forces groove 154 over and into tight frictional engagement with the upstanding rim 140 around opening 118 to effect the seal provided by the dispenser of the invention.

As shown in Figures 9 and 10, the dispenser is preferably formed with an open bottom end to provide means for filling it with particulate material. A snap-fitting bottom end cap 114 is provided to seal the open bottom end 112. The periphery 164 of cap 114 is shaped to surround and frictionally engage a bead 166 provided on bottom end 112 for a tight, sealed closure.

The dispensing container is most advantageously used for spreading particulate material on a flat surface such as a sanitary napkin or surgical dressing. This is accomplished by tilting the container so that top front corner 120 rests on or is held just above the surface to be coated, the index finger

is pressed against the rear cover flap to pivot the cover into its open position, and a container side is then tapped by the user's middle or third finger to expel particulate material through the sieve-like passage formed by teeth 130 as the container is moved over the surface.

Although bottom end 112 of container body 110 has been shown open in a preferred embodiment, it will be understood that the container may be formed with a closed bottom end, and that the top of the container body may be made removable in the form of a top end cap to provide means for filling the dispenser as disclosed in U.S. Patent No. 3,383,015. For this modified structure, the open top end of container body 110 will be provided with a bead similar to bead 166, and the top end cap which will contain opening 118, supports 124 and recess 128 will be formed with a periphery similar to periphery 164 of the bottom end cap 114 discussed above. In either embodiment the container and pivotal cover are formed of only three pieces of molded plastic.

It will also be understood that the upper portion of the dispensing container of the invention may be made in the form of a top end cap with attached pivoting cover, and marketed as a separate unit for use on container bodies made or provided by different manufacturers, as for example, on metal can containers.

WHAT WE CLAIM IS:—

1. A dispensing closure assembly for a bottle or other container, comprising at least one opening for communicating with the interior of the container, a closure member pivotally supported over said opening or openings, said closure member being manually pivotable by application of finger pressure to the rear side thereof into an open position, and by finger pressure to a forward portion thereof into a closed position, the forward portion being removed from those regions of the closure assembly with which, in operation of the assembly, the contents of the container comes into contact and means limiting the extent of pivotal movement of said closure member.

2. A dispensing closure assembly as claimed in claim 1, wherein the limit means comprises a recess adjacent said opening and a resilient flap on said closure member spaced from the pivot thereof, said flap having a depending portion extending adjacent to said recess and being manually deformable to steer said depending portion into said recess to permit limited pivotal movement of said closure member.

3. A dispensing closure assembly as claimed in claim 2, wherein the depending portion engages an edge portion of the top when the closure member is pivoted to its

closed position so as to latch the closure member in said position.

4. A dispensing closure assembly as claimed in claim 1, including a recess having a concave bottom surface, at least one opening through said concave surface permitting access from the container interior to the recess, and opposed pivotal bearing means within said recess and formed integrally with the closure assembly, said closure member being disposed in said recess and comprising a pair of aligned pivot shafts engaged with said bearing means, a convex curved portion corresponding to said concave bottom surface of the recess and slidably engaged therewith as the closure member is pivoted about the axis of the bearing means, and a tubular spout opening through said closure member and having an entrance port in the convex surface of said closure member in alignment with the opening through said concave bottom surfaces of the recess when the closure member is in its open position and an exit port at the opposite end of the tubular spout extending above the closure assembly when the closure member is in its open position.

5. A dispensing closure assembly as claimed in claim 4, wherein the limit means comprises a skirt portion depending from one edge of the closure member, said skirt portion engaging a peripheral edge portion of the closure assembly when said closure member is in its closed position and being manually deformable to disengage from said edge portion to enable the closure member to pivot into its open position, in which position said skirt portion engages a bottom surface of the recess or means adjacent the bottom surface, to limit the pivotal movement of the closure member into said open position.

6. A dispensing closure assembly as claimed in claim 4 or 5, wherein the entrance port of the spout is sealed against the concave bottom surface of the recess and the exit port is pressed below the rim of the closure assembly when the closure member is pivoted to the closed position.

7. A dispensing closure assembly as claimed in claim 4, 5 or 6, including a second opening through the concave bottom surface of the recess and connecting with a downwardly extending vent tube, and a second tubular opening through the convex surface of the pivoted closure member aligned with said second opening when said closure member is in its open position whereby air is admitted to the container to displace liquid poured therefrom and to enable steady continuous pouring.

8. A dispensing closure assembly as claimed in claim 4, 5, 6 or 7 including an annular raised lip on the concave surface of the recess surrounding the opening, or at least one of the openings, whereby a liquid-tight seal

is formed with said closure member in both its open and closed positions.

9. A dispensing bottle cap closure assembly as claimed in any one of the preceding claims 4 to 8, including a depending annular skirt adapted to receive and surround the mouth of a bottle and means within the skirt for sealing the cap closure assembly to the mouth of the bottle.

10. A dispensing cap closure assembly as claimed in claim 9, wherein the annular skirt has first means for securing the cap to the top of the bottle and second means within the skirt cooperating with said first means for effecting sealing engagement of the cap closure assembly with the annular lip of the bottle to which the cap closure assembly may be secured by said first means.

11. A dispensing cap as claimed in claim 20, wherein said first securing means on the annular skirt comprises helical screw threads engageable with corresponding screw threads on the neck of the bottle.

12. A dispensing cap closure assembly as claimed in claim 10, wherein said first securing means comprises an annular ring on the inner surface of the annular skirt for rollable locking engagement with a corresponding annular ring on the outer surface of the bottle neck.

13. A dispensing cap closure assembly as claimed in claim 9, 10, 11 or 12 as appendant to claim 7, wherein the vent tube extends downwardly for a distance at least equal to the length of the annular cap skirt.

14. A dispensing top closure assembly as claimed in claim 1, 2 or 3 including means forming a sieve-like passage adjacent said opening through which materials from the interior of said container may be dispensed when said closure member is open.

15. A dispensing top closure assembly as claimed in claim 1, 2, 3 or 14, including first sealing means on said closure member engaged with second sealing means adjacent said opening when said closure member is closed to seal said opening against the leakage of material therethrough.

16. A dispensing closure assembly as claimed in any one of the preceding claims, wherein the closure assembly including the pivoted closure member is formed from plastics material.

17. A dispensing bottle cap closure assembly constructed and adapted to operate substantially as hereinbefore described with reference to Figures 1 to 5 of the accompanying drawings.

18. A dispensing bottle cap closure assembly constructed and adapted to operate substantially as hereinbefore described with reference to Figures 6, 7 and 8 of the accompanying drawings.

19. A dispensing closure assembly constructed and adapted to operate substantially

as hereinbefore described with reference to Figures 9 to 12 of the accompanying drawings.

20. A bottle or any other container having a dispensing closure assembly as claimed in any one of the preceding claims.

21. A dispensing container comprising a hollow container body, means on said container communicating with the interior thereof, a closure member pivotally supported over said opening or openings, said closure member being manually pivotable by application of finger pressure to the rear side thereof away from said opening to a position wherein said opening is exposed, and by finger pressure to a forward portion thereof toward said opening to a position wherein said opening is covered, the forward portion being removed from these regions of the closure member with which material from the container comes into contact during a dispensing operation, and first sealing means on said closure member engaging with second sealing means adjacent said opening when said closure member is closed to seal said opening against the leakage of material therethrough.

22. A dispensing closure assembly or container as claimed in claim 15 or 21, wherein said first sealing means comprises an upstanding rim surrounding the opening, and said second sealing means comprises a grooved skirt projecting from the closure member in alignment with said rim, the groove in said skirt being shaped to surround and frictionally engage said rim when the closure member is closed to seal said opening.

23. A dispensing container as claimed in claim 21, or 22, wherein the container body has a top front corner, the opening being located adjacent thereto and the closure member having a plurality of spaced tooth-like projections extending into said opening, and means limiting the extent of pivotal movement of said closure member away from said opening so that said projections are only partially withdrawn from said opening when said closure member is opened to form a sieve-like passage for spreading particulate material on a surface.

24. A dispensing container as claimed in claim 23, wherein said limit means comprises a recess in the container body, and a resilient flap on said cover to the side of the pivot thereof opposite said projections, said flap having a depending portion extending adjacent to said recess, and being manually deformable to steer said depending portion into said recess to permit limited pivotal movement of said closure member.

25. A dispensing container as claimed in claim 21, including a recess in said container body about said opening for accommodating the pivotal closure member.

26. A dispensing container as claimed in any one of the preceding claims 21 to 25,

wherein the container body is open at the end opposite to the closure member and further includes a snap-fitting closure for said open end.

- 5 27. A dispensing container as claimed in claim 26 wherein the container body, the closure member and the end closure are formed of molded flexible plastics material.

28. A dispensing container constructed and adapted to operate substantially as hereinbefore described with reference to Figs. 9 to 10 12 of the accompanying drawings.

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COMPLETE SPECIFICATION

5 SHEETS

This drawing is a reproduction of
the Original on a reduced scale
Sheet 1









